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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,255

05/09/2007

Woosuck Shin

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7022

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03/27/2009

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

EOM, ROBERT J

ART UNIT

PAPER NUMBER

1797

NOTIFICATION DATE

DELIVERY MODE

03/27/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/593,255	Applicant(s) SHIN ET AL.	
	Examiner ROBERT EOM	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 9-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/14/2006, 01/17/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, Claims 1-8 in the reply filed on 02/04/2009 is acknowledged.
2. Claims 9-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Groups, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 02/04/2009.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 4-7 rejected under 35 U.S.C. 102(b) as being anticipated by Zanini-Fisher et al. (USP 5,451,371).

Regarding claim 1, Zanini-Fisher et al. discloses a micro thermoelectric gas sensor (Fig. 2A-2F) comprising: a membrane for heat shielding (Fig. 2A, see: polysilicon layer 12) formed on a substrate (Fig. 2A, see: bulk silicon frame 10), a catalyst material that induces a catalytic reaction in contact with a gas to be detected (Fig. 2F, see: catalyst material 84), a thermoelectric conversion material film that converts a local temperature difference produced by heat generation caused by the reaction into a voltage signal (Fig. 2C, see: temperature sensing conductors 64), and a microheater for

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temperature control for facilitating stable gas detection of the gas sensor formed (Fig. 2C, see: heater 56), which are on the membrane, and a high-temperature section and a low-temperature section of a thermoelectric thin film formed on the same membrane (C4/L43-50).

Regarding claim 4, Zanini-Fisher et al. discloses all of the claim limitations as set forth above. Zanini-Fisher et al. further discloses a membrane with a thickness of 1 μm or less (C5/L2, see: 1000 Angstroms) is obtained by wet etching a rear surface of the substrate (Fig. 2A-2F).

Regarding claim 5, Zanini-Fisher et al. discloses all of the claim limitations as set forth above. Zanini-Fisher et al. further discloses a plurality of membranes are provided on the substrate (Fig. 2A-2F).

Regarding claim 6, Zanini-Fisher et al. discloses all of the claim limitations as set forth above. Zanini-Fisher et al. further discloses an insulating film is formed in a state of contact with the membrane on the membrane (Fig. 2A-2F, see: polysilicon layer 12), a bonding film is formed on the insulating film in a state of contact with the insulating film and a heater for serving to bond the insulating film and the heater (Fig. 2A-2F, see: silicon nitride layer 78), and a catalytic material layer is formed in thermal contact with said heater being electrically insulated by the insulating film (Fig. 2A-2F, see: catalyst material 84).

Regarding claim 7, Zanini-Fisher et al. discloses all of the claim limitations as set forth above. Zanini-Fisher et al. further discloses after a thermoelectric conversion

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material film pattern has been produced, the pattern is heat treated at a high temperature to improve crystallinity thereof (C5/L42-46).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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8. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zanini-Fisher et al. (USP 5,451,371), as applied to claim 1 above, in view of Elbel et al. (USP 4,665,276).

Regarding claims 2 and 3, Zanini-Fisher et al. discloses all of the claim limitations as set forth above. Zanini-Fisher et al. further discloses a plurality of thermoelectric sensors are provided (Fig. 1) where the thermoelectric conversion material film has a high-temperature section and a low-temperature section (C4/L43-50).

Zanini-Fisher et al. does not explicitly disclose the thermoelectric conversion material film is a thermocouple, where a plurality of thermocouples are provided, and the plurality of thermocouples are connected in serial.

Elbel et al. teaches a thermoelectric sensor with 6-15 single thermocouples connected in series (C1/L29-30).

Zanini-Fisher et al. and Elbel et al. are analogous because both references are directed towards thermoelectric sensors.

It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize thermocouples in the thermoelectric gas sensor of Zanini-Fisher et al., as taught by Elbel et al., since doing so is a simple substitution of one known element for another to obtain predictable results. Further, placing the thermocouples in series provides for responsivities of 7-23.5 V/W (Elbel et al. C1/L30-31).

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9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zanini-Fisher et al. (USP 5,451,371), as applied to claims 1 and 4-7 above, in view of Shin et al. (US 2003/0056570 A1).

Regarding claim 8, Zanini-Fisher et al. discloses all of the claim limitations as set forth above.

Zanini-Fisher et al. does not explicitly disclose the thermoelectric conversion material film is a SiGe thin film.

Shin et al. teaches a thermoelectric gas sensor with a thermoelectric conversion material film of SiGe compounds ([0037]).

Zanini-Fisher et al. and Shin et al. are analogous because both references are directed towards thermoelectric gas sensors.

It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize SiGe as the thermoelectric conversion material in the gas sensor of Zanini-Fisher et al., as taught by Shin et al. since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Visser et al. (USP 5,707,148) discloses a catalytic calorimetric gas sensor.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

/R. E./
Examiner, Art Unit 1797